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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/532,302	10/11/2005	Antonino Salvatore Arico	05788.0351-00000	1119
22852	7590	07/08/2009		
FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER LLP 901 NEW YORK AVENUE, NW WASHINGTON, DC 20001-4413			EXAMINER ALEJANDRO, RAYMOND	
			ART UNIT	PAPER NUMBER
			1795	
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			07/08/2009 PAPER	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/532,302

**Applicant(s)**

ARICO ET AL.

**Examiner**

Raymond Alejandro

**Art Unit**

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 May 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 33-64 is/are pending in the application.
- 4a) Of the above claim(s) 51-64 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 33-50 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 April 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-8508)
- Paper No(s)/Mail Date 04/22/05 and 10/11/05
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Election/Restrictions***

1. Applicant's election without traverse of Group I (claims 33-50) in the reply filed on 05/15/09 is acknowledged.

***Information Disclosure Statement***

2. The information disclosure statement (IDS) submitted on 04/22/05 and 10/11/05 was considered by the examiner.

***Drawings***

3. The drawings were received on 04/22/05. These drawings are acceptable.

***Specification***

4. The preliminary amendment filed 04/22/05 does not introduce new matter into the disclosure.
5. The abstract of the disclosure is objected to because it does not positively describe the particulars of the claimed invention. Correction is required. See MPEP § 608.01(b).
6. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

***Claim Objections***

7. Claims 45 and 49 are objected to because of the following informalities: all parenthesis should be removed for better understanding of the claims. Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(e) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 33-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over the publication of Kim "*Cu-Ni Cermet Anodes for Direct Oxidation of Methane in Solid-Oxide Fuel Cells*" (herein called Kim) in view of Iacovangelo et al 4423122.

As to claims 33 and 44:

Kim discloses solid oxide fuel cells using anodes made of Cu-Ni alloys with ceramic materials (Cu-Ni cermet anodes) (*See Title, Abstract, Experimental and Results/Discussion*). The SOFC includes the anode, the cathode and the electrolyte (*See first column on 1st page & Experimental and Results/Discussion*).

As to claims 38-43:

The anode of Kim can be made of the following metal compositions 100 % Cu; 90 % Cu - 10 % Ni; 80 % Cu-20% Ni; 50 % Cu-50% Ni; and 100 % Ni (*See FIGURE 1 & Table*) or having the following weight ratio ranging from Cu-Ni (9:1) to Cu-Ni (4:1) (*See Table 1 & Results/Discussion*). The ceramic-metal (cermet) composites of Kim have alloy compositions of 0, 10, 20, 50 and 100 % Ni (Abstract).

As to claims 45, 48 and 49:

The ceramic material of Kim includes yttria-stabilized zirconia (YSZ) and/or LSM (a composition made of La-Sr-MnO<sub>3</sub>) (*See Experimental*). *With respect to claim 49, since one of the ceramic materials of the Markush group of claim 45 has been shown, it is unnecessary to show any one of the remaining ceramic materials thereof.*

As to claim 50:

Kim discloses the use of dry methane (Abstract).

Kim discloses a solid oxide fuel cell as described above. However, the preceding reference neither expressly disclose the specific particle size of both the alloy and the ceramic material nor the mean surface area.

As to claims 33-37 and 46-47:

Iacovangelo et al disclose electrodes for high temperature fuel cells (title, abstract) which are composed of a nickel-copper alloy encapsulated ceramic particle material (abstract/COL 1, lines 9-15/ COL 2, lines 50/COL 4, lines 25-30) wherein the particle size of the nickel-copper alloy ceramic material ranges from about 0.1 micron to about 20 microns (COL 2, lines 20-35/COL 3, lines 3-7). Iacovangelo et al further disclose that the specific size/thickness of the Ni-Cu depends largely on the size of the ceramic powder (COL 2, lines 63-67).

*In this case, the particle size of the nickel-copper alloy encapsulated ceramic particle material is taken to represent the particle size of both the alloy and the ceramic material as Iacovangelo et al does not appear to make a distinction between one and the other. Additionally, the mean surface area is considered to be an inherent characteristic or property present in the combined teachings of the prior art as the prior art shows substantially the same materials, and constitution thereof (i.e. particles). Accordingly, products of identical chemical composition can not have mutually exclusive properties, and thus, the claimed property, is necessarily present in the prior art material. "Products of identical chemical composition can not have mutually exclusive properties." A chemical composition and its properties are inseparable. Therefore, if the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims are necessarily present. In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). See MPEP 2112.01 [R-3] Composition, Product, and Apparatus Claims*

In view of the above, it would have been obvious to a skilled artisan at the time the invention was made to make the electrode of Kim by having the specific particle sizes of both the alloy and ceramic material as instantly claimed because Iacovangelo et al teach that anodes having alloy and ceramic materials with the foregoing particle size do exhibit excellent electrochemical activity for the fuel cell reactions and make production on a commercial scale feasible. Moreover, Iacovangelo et al recognizes the particle size of the alloy and ceramic material as a variable which achieves a recognized result, thus, the claimed range of the particle size results from the characterization as routine experimentation of an optimum or workable range. Accordingly, the particle size is being construed as a result-effective variable. *In re Aller* 105 USPQ 233, 235; *In re Hoeschele* 160 USPQ 809, *In re Antonie* 195 USPQ 6 (MPEP 2144.05 II. Optimization of Ranges). Generally speaking, differences in sizes or dimension will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such size or dimension is critical. “[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.” *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). Thus, it is *prima-facie* obvious to choose or select the specific particle size of the alloy and ceramic material. **See MPEP 2144.05 Obviousness of Ranges.** Further, where the only difference between the prior art and the claims is a recitation of relative dimensions (changes in size/proportion) of the claimed feature and a feature having the claimed relative dimensions would not perform differently than the prior art feature, article, element, or member, the claimed feature, article, element, or member is not patentably distinct from the prior art feature, article, element, or member. That is, limitations relating to the size of the feature, article, element, or

*member are not sufficient to patentably distinguish over the prior art as it is noted that changes in size is a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular size of the claimed particle is significant. In re Rose 105 USPQ 237; In re Rinehart 189 USPQ 143; In Gardner v. TEC Systems, Inc., 220 USPQ 777 & 225 USPQ 232, (See MPEP 2144.04 [R-1] Legal Precedent as Source of Supporting Rationale)*

12. Claim 48 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kim “*Cu-Ni Cermets Anodes for Direct Oxidation of Methane in Solid-Oxide Fuel Cells*” (herein called Kim) in view of Iacovangelo et al 4423122 as applied to claim 45 above, and further in view of Batawi et al 2002/0061429.

Kim and Iacovangelo et al are both applied, argued and incorporated herein for the reasons above. However, none of the preceding references expressly disclose the specific doping material.

Batawi et al disclose that it is known in the art to dope ceramic material used for solid oxide fuel cell anode with at least Ca and/or Y, among others (CLAIM 3, abstract).

In view of the above, it would have been obvious to a skilled artisan at the time the invention was made to dope the ceramic material of Kim and Iacovangelo et al with the specific doping material of Batawi as Batawi et al teach that such a doping material enhances the electrochemical characteristic of the ceramic material, and make the ceramic material more chemically stable and compatible.



13. Claim 49 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kim "*Cu-Ni Cermet Anodes for Direct Oxidation of Methane in Solid-Oxide Fuel Cells*" (herein called Kim) in view of Iacovangelo et al 4423122 as applied to claim 45 above, and further in view of the publication Livermore "*Fuel reforming and electrical performance studies in intermediate temperature ceria-gadolinia-based SOFCs*" (herein called Livermore).

Kim and Iacovangelo et al are both applied, argued and incorporated herein for the reasons above. However, none of the preceding references expressly disclose the specific ceramic material.

Livermore discloses SOFC using anodes made of ceria-gadolinia (CGO) materials (abstract, title, Introduction).

In view of the above, it would have been obvious to a skilled artisan at the time the invention was made to use the specific ceramic material of Livermore as the anode in the solid oxide fuel cell of Kim and Iacovangelo et al as Livermore shows that such a material enhances electrical performance and durability of the anode, and also shows good electrochemical and reforming activity.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (571) 272-1282. The examiner can normally be reached on Monday-Thursday (8:00 am - 6:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Raymond Alejandro/  
Primary Examiner, Art Unit 1795